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RM-2435-HD

2RU, 4-Screen, 3.5” HD/SD-SDI and CVBS Audio/Video Monitors

User Guide

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panorama®

the video division of Wohler

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RM-2435-HD User Guide

Introduction

Overview

This 2U rack-mounted audio/video monitor sets a new standard in LCD monitors for broadcast and professional video applications. The RM-2435-HD has 640 x 480 resolution with anti-glare TFT screens, and full digital signal processing support: HD-SDI and analog composite video standards. All video formats are scaled to fit on screen in the highest quality using full, digital processing, precision scaling, and gamma correction to produce the best images available.

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Safety Instructions

1. Read, keep, and follow all of these instructions; heed all warnings.
2. Do not use this equipment near water.
3. Use only a dry cloth to clean the equipment.
4. Do not block any ventilation openings. Install only in accordance with the instructions in the section entitled, "Front Panel Controls" on page 6.
5. Do not install near any heat source such as a radiator, heat register, amplifier, or stove.
6. Do not expose the equipment to rain or moisture.
7. Do not attempt to plug the unit into a two-blade outlet (with only two prongs of equal width).

IMPORTANT: By design, these audio/video monitors will only plug into a three-prong outlet for your safety. If the plug does not fit into your outlet, contact an electrician to replace the obsolete outlet.

8. Protect the power cord from being walked on or pinched, particularly at plug's source on the equipment and at the socket.
9. Use only the attachments/accessories specified by the manufacturer.
10. Unplug the equipment during lightning storms or when unused for long periods of time.
11. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:
    - The equipment has been damaged in any way, such as when the power-supply cord or plug is damaged.
    - Liquid had been spilled or objects have fallen onto the equipment.
    - The equipment has been exposed to rain or moisture.
    - The equipment does not operate normally.
    - The equipment has been dropped.

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Installation Recommendations

Mounting

The unit is designed to install into a standard 19" rack. The unit should be mounted at approximately ear level for optimum frequency response and at eye level for optimum visual observation.

Heat Dissipation

No special physical mounting considerations are necessary regarding heat dissipation except under adverse conditions, provided the ambient temperature inside the mounting enclosure does not exceed 40°C (104°F). Adjacent devices can be rack mounted (or stacked) in proximity to the unit. If the temperature is above 40°C, allow a 1RU (1.75"/44.45mm) space above and below the unit for air circulation.

DC Power

Connect the unit to its external 100 to 240VAC (50 to 60Hz) to 12VDC power supply (included).

Features

The RM-2435-HD audio/video monitor is designed for confidence monitoring of HD/SD-SDI and composite video broadcast signal (CVBS) video sources. Input signals are automatically detected and accommodated. Up to eight of the sixteen audio channels embedded in an HD/SD-SDI bit stream may be selected for visual monitoring on eight on-screen bar graph style level meters. A **Headphone Jack** provides audible stereo monitoring of the left/right channels.

Each of the four high-resolution LCD screens display high definition or standard definition video at either 4:3 or 16:9 aspect ratio. Parameters are selected and adjusted using an On Screen Display (OSD) MENU. One function button may be programmed as a hot key for quick

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parameter settings. A DB9 connector serves as the interface to the four tally lights on the front panel.

Additional overlays can be added by the operator for safe area and safe title markers, center mark, time code, and display name. **Time code** is derived from embedded HD/SD-SDI source.

The slim and light weight design provides four screens in a very compact rack-size (2RU) while the chassis only has 2.2 inches of depth.

The feature-rich audio/video monitors provide all of the following:

- Four 3.5″ LCDs
- Selectable 16:9 or 4:3 screen aspects for on screen video
- Rack mount mechanical design with vertical tilt
- Audio demux and display for up to eight channels from the sixteen embedded in each HD/SDI-SDI source
- Monitoring of embedded audio through headphones
- Visually monitor audio levels on meters assignable to any channel
- Level meters can display VU, PPM (PK) or both with assignable -22db to -18db level
- Local control (via menu operation) for all functions including:
    - Blue gun as mono
    - Safe area
    - Safe title
    - Center markers
    - H/V delay
    - Monochrome display mode
    - Over/underscan
    - Display of **Input Signal** format

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  - Display of input time code and up to 10 characters of user-defined text
  - **Time Code** and text position in top or bottom of screen
  - Red/green/yellow/white text color
  - Built in color bars 75% full field
  - User-defined configuration
  - Auto sets at power up
  - **Waveform** monitor
- User defined hot key functionality provides all of the following:
  - H/V delay toggle through functions
  - Underscan toggle on/off
  - On Screen Display (OSD) on/off
  - Color bar on/off
  - Audio monitor display on/off
  - Area marker toggle

Specifications

The specifications of the audio/video monitors are listed below.

Table 1–1 RM-2435-HD Specifications

Specification	RM-2435-HD Domain Range
Number of Screens	4
Display	3.5″ diagonal
Native Aspect Ratios	4:3
Viewing Angle (Tilt)	100°H x 50°V
Screen Colors	262,000

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Table 1–1 RM-2435-HD Specifications (Continued)

Specification	RM-2435-HD Domain Range
Resolution (Dots, H x V)	640 x 480
Dot Pitch (H x V, mm)	0.1125 x 0.1095
Contrast Ratio	350:1
Pixel Response (ms)	<40 typical
Dimensions (W x Hmm)	19″ x 3.5″ x 2.2″ (486 x 89 x 56 mm)
Power Consumption	12VDC/10 Watts (3.8 Amps max) CE & UL power supply
Operating Temperature	0°C (32°F) to 40°C (104°F)
Video Format	NTSC/PAL auto recognition
Inputs	HD/SD-SDI, Analog Composite (1 BNC per screen)
Outputs	HD/SD-SDI Re-clocked output (1 BNC per Screen)
Space Required	2 rack units of an EIA-19 standard equipment rack
Supplied Accessories	AC power adapter

Note: All of the specifications listed above are subject to change without notice.

Front Panel Controls

The front panel feature descriptions refer to Figure 1–1 and Figure 1–2 below.

Figure 1–1 RM-2435-HD Front Panel

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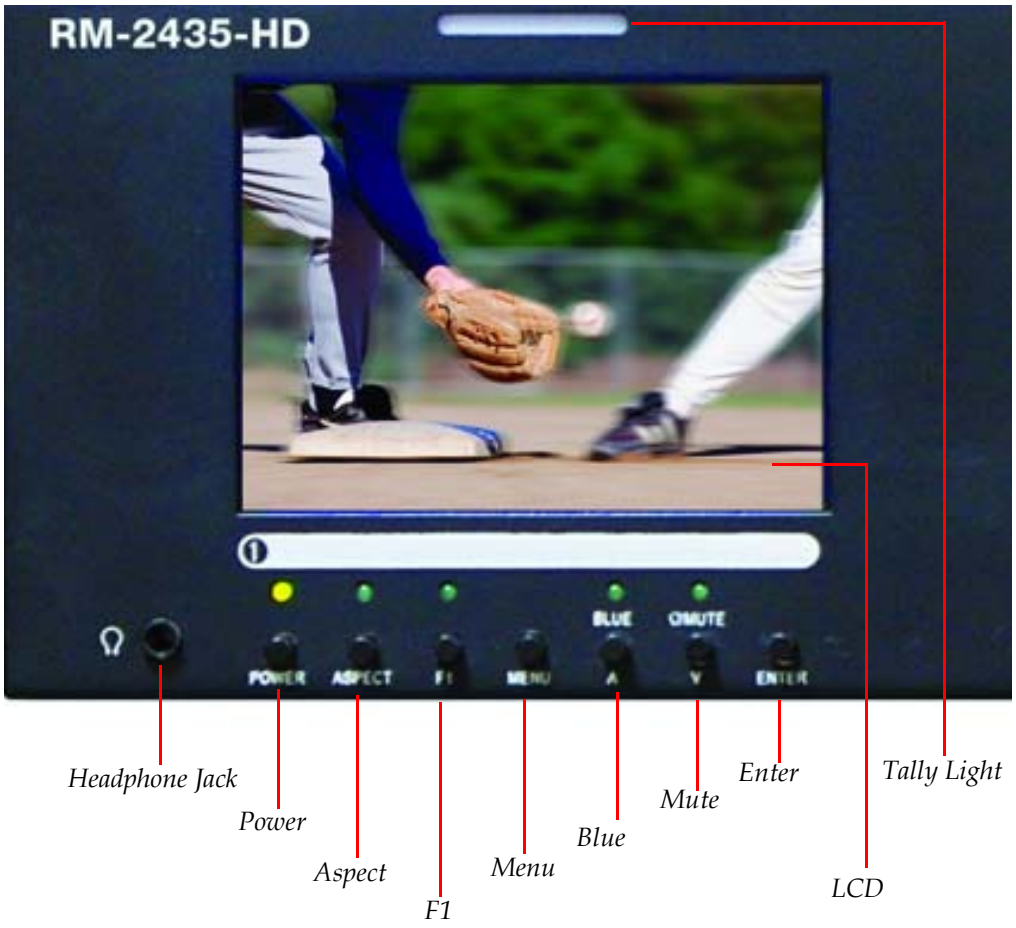
- **Tally Lights**: These tri-color (red/green/amber) lights are controlled through a DB9 connector on the rear of the panel. For more information about the rear panel DB9 connector, refer to "Rear Panel Connectors" on page 9..

Figure 1–2 RM-2435-HD Front Panel Menu



- **Headphone Jack:** Monitor the assigned left/right stereo audio channels with stereo headphones from this mini-stereo connector.

- **Power:** Each of the four **Power** buttons turn the associated LCD screen on and off; the LED glows green to indicate on. When the indicator above the power switch is green then the unit is receiving power. When the indicator is flashing, the unit is in stand-by mode.

- **Aspect:** The **Aspect** button toggles the aspect ratio between 4:3 and 16:9 for the associated LCD screen. The LED glows green to indicate 16:9.

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- **F1:** The **F1** button is programmable as a hot key for parameter adjustments. Refer to "Programming the Hot Key Buttons" on page 13 for more information.

- **Menu:** Pressing the **Menu** button displays the **OSD** (On-Screen Display) **Menu**. Refer to "Using the OSD Menu" on page 11 for more information.

- **Blue** or ∧**:** When the **OSD Menu** is not active, pressing this button toggles between three settings: blue monochromatic, grey scale monochromatic, and full color. When the **OSD Menu** is active, this button serves as the up (∧) navigation button in the menu.

- **Mute** or ∨: When the **OSD Menu** is not active, this button is used to select the audio source for monitoring through the headphones. Press this button on whichever LCD section you wish to audibly monitor, and the green LED will light to indicate your selection. Pressing it a second time will mute the audio. Subsequent presses will toggle the mute off and on. The green LED flickers to indicate the mute is on. When the **OSD Menu** is active, this button serves as the down (∨) navigation button in the menu.

- **Enter:** When the **OSD Menu** is displayed, pressing this button enters items and accepts selections in the **OSD Menu**. Otherwise, it acts as a quick menu to select parameters for adjustment. Refer to "Programming the Hot Key Buttons" on page 13 for more information.

- **LCD Screen:** The LCD screens display the audio and video meters.

Rear Panel Connectors

The rear panel feature descriptions refer to the following image.

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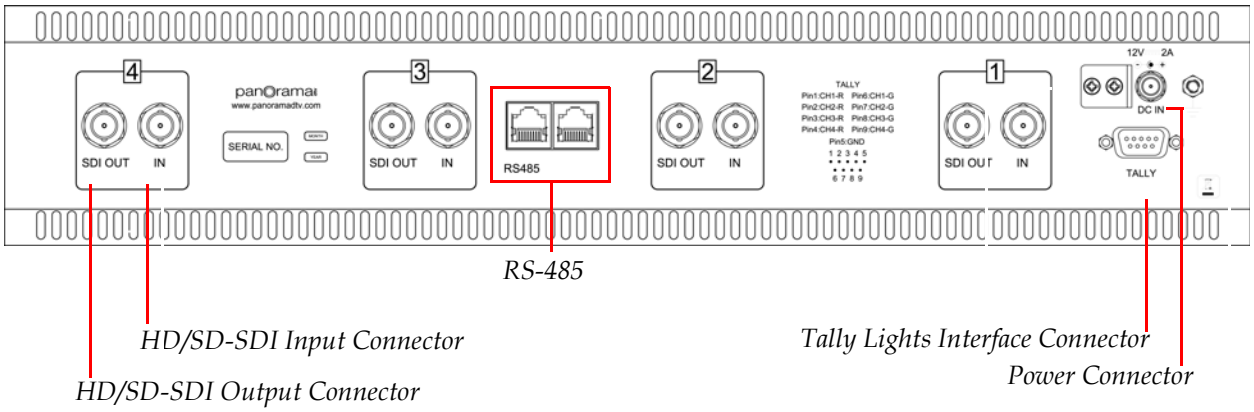
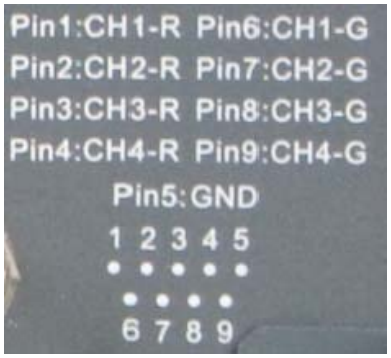
Figure 1–3 RM-2435-HD Rear Panel



- **HD/SD-SDI Output:** The system re-shapes and re-clocks an HD/SD-SDI signal before outputting it to this female BNC connector.
- **HD/SD-SDI Input:** This auto-detecting, input connector accepts HD/SD-SDI or analog CVBS video signals. The inputs comply with SMPTE259M, SMPTE292M/ITU-R BT601. Composite video inputs comply with SMPTE-170M.
- **RS-485**: Reserved for future use.
- **Power:** To provide power to the unit, attach the supplied 100 to 240VAC to 12VDC power supply to this connector.
- **Tally Interface:** This DB-9 connector controls the tally lights on the front panel. Refer to Figure 1–4 below for the pin out.

Figure 1–4 Rear Panel DB-9 Connector Pin Out



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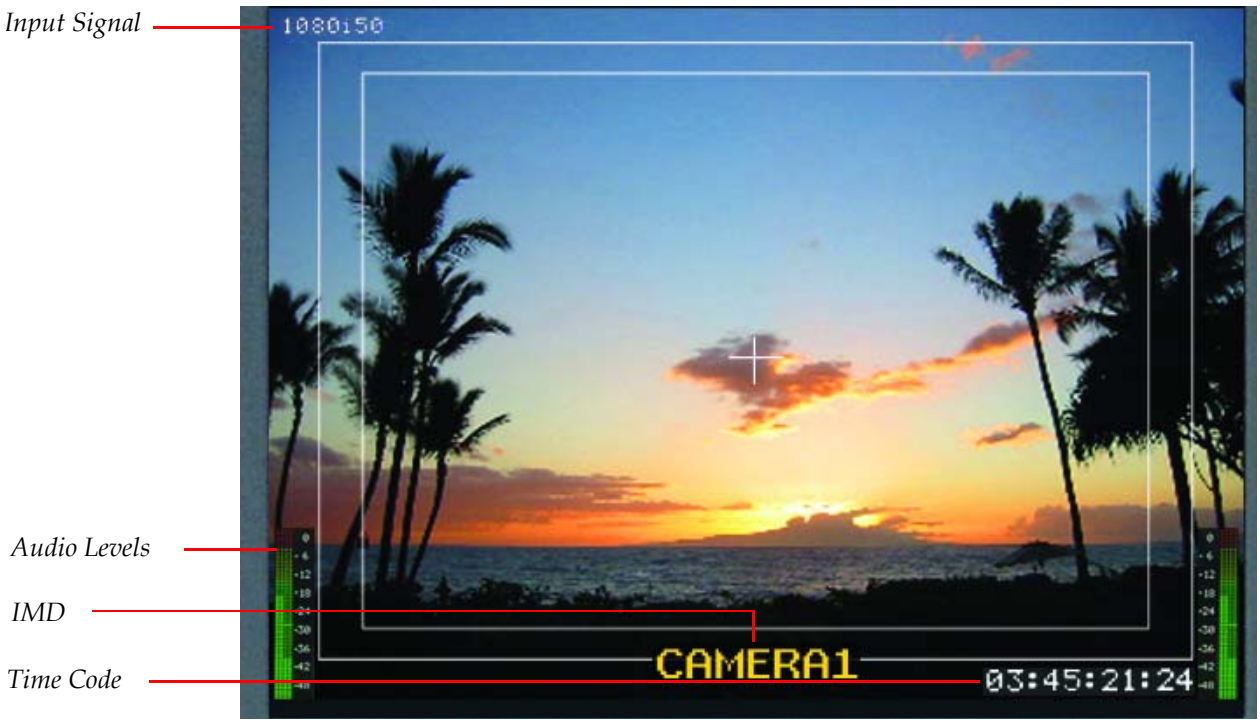
On-Screen Display Features

Some of the buttons and **OSD Menu** control the display of features on the screen as shown in Figure 1–5 on the next page.

Figure 1–5 Display Features



- **Input Signal:** The input signals are automatically detected.
- **Audio Levels:** Levels for the selected eight of 16 audio channels de-embedded from an HD/SD source are displayed on eight meters. Four meters on the left side and four on the right.
- **IMD:** The OSD MENU provides settings to customize the IMD (In Monitor Display) text area to show a line of characters, numbers, and some symbols.
- **Time Code:** The de-embedded time code from the HD/SD-SDI source displays in the bottom right corner.

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Using the OSD Menu

A description of how to use the **OSD Menu** follows. Also refer to Table 1–2 below for typical values and domain ranges.

1. Press the **Menu** button to display the menu.

   Note: If you do not press another button for approximately 10 seconds, the menu will disappear from the screen.

2. Use the **Up** and **Down** buttons to navigate through the seven sub-menu icons. The sub-menus are:

   A. STATUS (No configurable options)

   A. VIDEO

   B. AUDIO

   C. MARKER

   D. OSD

   E. USER CONTROL

   F. USER CONFIG

3. Press the **Enter** button to enter the chosen sub-menu.

4. Use the **Up** or **Down** buttons to cycle through the sub-menu selections.

5. When the desired option is highlighted, press the **Enter** button to select it.

6. Use the **Up** or **Down** buttons to adjust the parameter value up or down, make a selection, or turn a function on or off.

Press the **Menu** button to back out of a parameter or sub-menu. Press the **Menu** button again to remove the menu from the screen.

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Table 1–2 OSD Menu Structure

Menu	Parameters	Default Value[a]	Domain Range
VIDEO	BRIGHTNESS	128	0 to 255
	CONTRAST		
	SATURATION		
	SHARPNESS		
	HUE		
AUDIO	MET 1 TYPE	VU+PK	VU, PK, VU+PK, NONE
	MET 2 TYPE		
	MET 3 TYPE		
	MET 4 TYPE		
	MET 1-L SRC	CH 1	CH 1 to CH 16
	MET 1-R SRC	CH 2	
	MET 2-L SRC	CH 3	
	MET 2-R SRC	CH 4	
	MET 3-L SRC	CH 5	
	MET 3-R SRC	CH 6	
	MET 4-L SRC	CH 7	
	MET 4-R SRC	CH 8	
	TEST LEV	-20 db	-20DB to -18DB
	HEADPHONE	ON	ON or OFF
	AUDIO MON	MET 1	MET 1, MET 2, MET 3, or MET 4
	VOLUME	-20dbfs	-30db to 0db
	METER HPOS 1	000	0 to 200
	METER HPOS 2		0 to 200
	METER SIZE	LARGE	SMALL or LARGE
MARKER	AREA		2.35:1, 1.85:1, 15:9, 14:9, 13:9, 4:3, OFF
	SAFE MARKER		ON or OFF
	CENTER		
	90%		
	80%		
ZOOM	ZOOM		NORMAL or UNDERSCAN
H/V DELAY	H/V DELAY		H/V, V, H, OFF

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Table 1–2 OSD Menu Structure (Continued)

Menu	Parameters	Default Value[a]	Domain Range
STATUS INDICATION	STD DISP		AUTO OFF, ON, or OFF
	TC (Time Code) DISP		ON or OFF
	WFM (waveform Monitor) DISP		
	IMD (In Monitor Display) DISP		
	IMD POS		TOP or BOTTOM (Note: This feature is disabled on models that include the waveform meter to avoid visual overlap.)
	IMD COLOR		RED, GREEN, YELLOW, or WHITE
	IMD:		A user-definable input string of up to 10 alphanumeric characters (also includes some symbols)
CONFIG	DEFAULT		UNSET or SET
	USER		H/V DELAY, UNDER SCAN, OSD CONTROL, COLOR BAR, AUDIO MON, AREA MARKER, or SAFE MARKER
	OSD CONTROL		ON or OFF
	COLOR BAR		DISABLE

a Only the VIDEO and AUDIO menus have default values.

Programming the Hot Key Buttons

The Enter Button

When the OSD Menu is not displayed, you can press the Enter button to quickly adjust the following parameters:

1. AUDIO MON: This option has four values, MET 1, MET 2, MET 3 and MET 4. Selecting MET 1 enables the first audio monitor. Likewise, if you select another MET, the system will monitor the corresponding audio source.

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2. VOLUME: This option regulates the volume from -30db to 0db.

3. BRIGHTNESS: This option regulates the video brightness from -116 to 139, where 0 is the typical value.

4. CONTRAST: This option regulates the image contrast from -128 to 127, where 0 is the typical value.

5. SATURATION: This option regulates the color saturation of the image from -128 to 127, where 0 is the typical value.

6. SHARPNESS: This option regulates the sharpness of the image from 0 to 15, where 0 is the typical value.

7. HUE: This option regulates the hue of the image from -32 to 31, where 0 is the typical value.

Note: By selecting the DEFAULT option in the CONFIG sub-menu, you can reset the parameters of the BRIGHTNESS, CONTRAST, SATURATION, SHARPNESS, and HUE options to zero (0).

The User Button

You can use the User button as a hot key. Assigning a parameter to this button allows that parameter to be displayed and adjusted on-screen at the press of the button without displaying and navigating through the OSD Menu.

To program the hot key:

1. Press and hold the Menu button.

2. Use the Up and Down buttons to find the CONFIG sub-menu and press the Enter button to select it.

3. Use the Up and Down buttons to cycle to the User selection and press the Enter button to select it.

4. Use the Up and Down buttons to select the following eight parameters. Press the Menu button to exit the sub-menu. (Refer to Table 1–2 starting on page 12 for the domain range for each of these parameters.)

   - H/V DELAY

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- UNDER SCAN
- OSD CONTROL
- COLOR BAR
- AUDIO MON
- AREA MARKER
- SAFE MARKER

Technical Functional Overview

The following block diagram illustrates the overall functionality of the RM-2435-HD.

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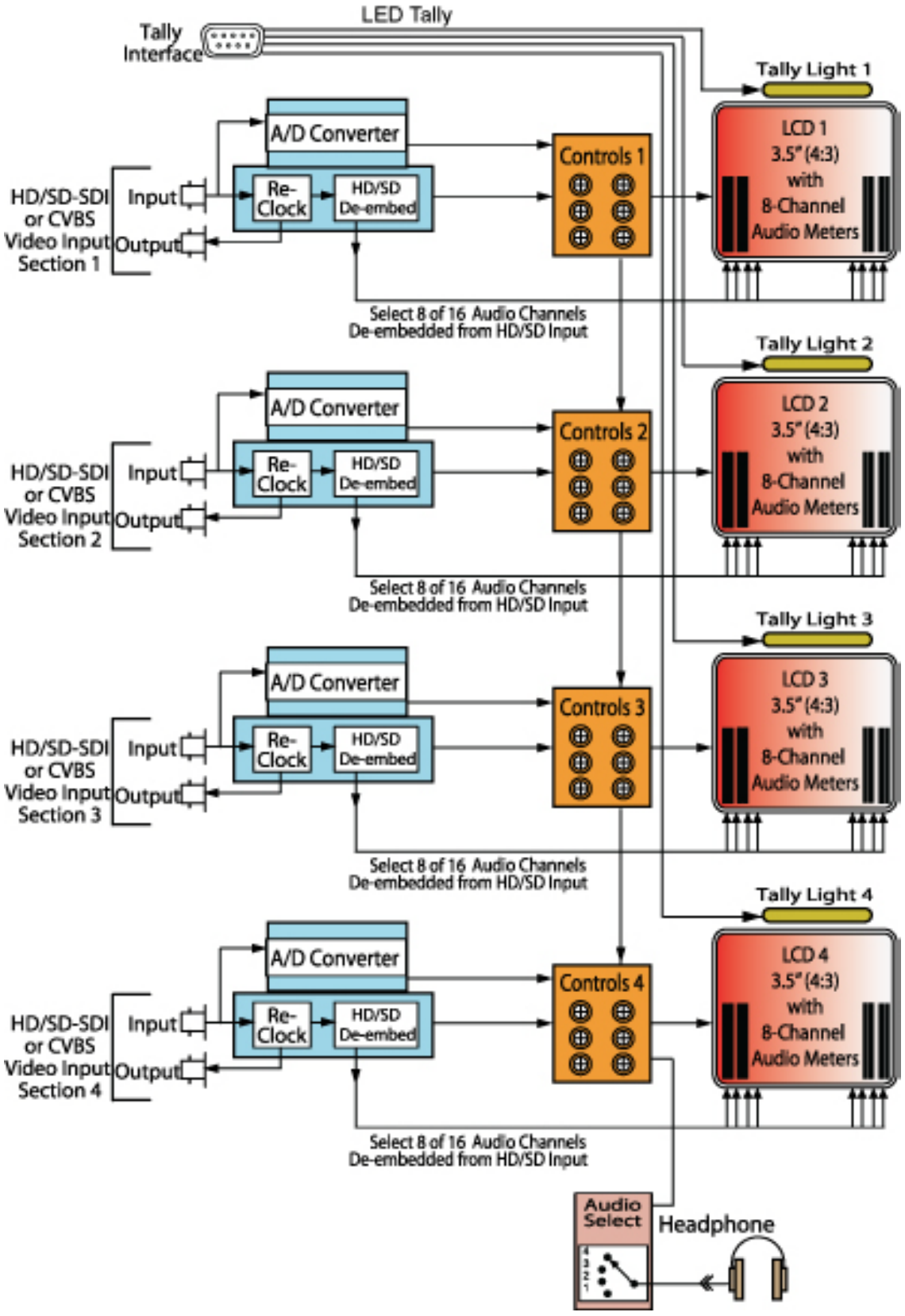
Figure 1–6 RM-2435-HD Block Diagram



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